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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/683,838	02/21/2002	Jeffrey Thomas Remillard	201-0919 FAM	9683

28549 7590 08/06/2003

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EXAMINER

HANNAHER, CONSTANTINE

ART UNIT PAPER NUMBER

2878

DATE MAILED: 08/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/683,838

Applicant(s)

REMILLARD ET AL.

Examiner

Constantine Hannaher

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement submitted February 22, 2002 would appear to be entirely identical to the information disclosure statement submitted February 21, 2002 and evidence of consideration will not be repeated.

Drawings

2. The drawings are objected to because in Fig. 2B the length of the delay of the camera window in the pulse sequence 50 has been improperly identified. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The status of copending U.S. applications mentioned in the specification, if known, should be updated.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 17 and 19 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Laughlin (US004129780A).

With respect to independent claim 17, Laughlin discloses a method of detecting objects 34 corresponding to the illustrated system (Fig. 1) which is fairly identified as of the "night vision" type in view of the light source emission at 820nm (column 3, line 27). The method of Laughlin

comprises the steps of activating a light source **10** in the form of a plurality of constant intensity light pulses to form a pulse train (column 4, lines 44-46), activating a camera **40** in the form of a plurality of detection windows throughout the pulse train for receiving reflected light **48** resulting from the corresponding light pulses and wherein a time delay between each subsequent detection window is increasing throughout the pulse train (column 4, lines 17-21), the light pulses in beam **32** and the detection windows being configured such that objects **34** nearer the night vision system are imaged by fewer light pulses than objects **34** further away from the night vision system (column 5, lines 1-16).

With respect to dependent claim 19, the method of Laughlin further comprises integration and display by receiver **40** (column 4, lines 38-43).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Catalano (US004671614A).

With respect to independent claim 1, Catalano discloses a method of detecting objects corresponding to the illustrated system (Fig. 1) which is fairly identified as of the “night vision” type in view of the light source **1** of infrared (column 2, line 63) and the infrared/night-vision equipment **9** (column 3, lines 11-12). Those of ordinary skill in the art would have recognized that such equipment as is identified by Catalano qualified as a “camera.” The method of Catalano would have comprised the steps of activating the light source **1** in the form of a sequence of light pulses **10** (Fig. 2 and column 4, line 56) for a predetermined number of pulses (n) to form a pulse train, activating the camera **9** in the form of a corresponding sequence of detection windows **12** wherein each of the windows **12** corresponds to one of the light pulses **10** for receiving reflected light **6** resulting from the corresponding light pulse **12** and a time delay between each corresponding light pulse **10** and detection window **12** is increasing throughout the pulse train (Fig. 2). Catalano further suggests that attention and/or adjustment to a variable such as the “intensity of illuminating light” would be required in a working system (column 6, lines 27-31). Accordingly, those of ordinary skill in the art already have an explicit instruction to adjust the “intensity of illuminating light” and since it would take less than ordinary skill in the art to sequentially reduce the intensity of each light pulse in the pulse train, in view of the reduced return light **6** at the distance intervals up to and including the n^{th} and the poorer performance of the equipment **9**, it would have been obvious to one of ordinary skill in the art at the time the invention was made to specify that the light source **1** activated in the method of Catalano formed a sequence of light pulses in which each light pulse had its illuminating intensity adjusted to increase over the intensity of the previous light pulse in the sequence.

With respect to dependent claim 2, an integrated view of the entire distance from the first to the last distance interval is an explicit goal of the method of Catalano (column 6, lines 21-25). When replacing the eyes of human observer 3 with a TV camera (column 3, lines 1-2) or infrared/night-vision equipment (column 3, lines 11-12), it would have been obvious to one of ordinary skill in the art at the time the invention was made that summation of all reflected light signals 6 and formation of a composite image would be the result of the described repetitive gating of shutter 4 (column 6, lines 19-27).

With respect to dependent claim 3, the generation of a video image from the reflected light signals 6 in a plurality of pulse trains in the method of Catalano would have been obvious to one of ordinary skill in the art at the time the invention was made in view of the descriptions of a TV camera (column 3, lines 1-2) or infrared/night-vision equipment (column 3, lines 11-12) in view of the opportunity for recording and dissemination of the video image. A display of such a video image on a display for human operator 3 would have taken no more than ordinary skill in the art in view of the human observer's desire to see under the "nighttime conditions" (abstract).

With respect to dependent claim 4, the duration of each light pulse 10 and each detection window 12 in the method of Catalano is constant (Fig. 2, see also column 4).

With respect to dependent claim 5, the duration of each detection window 12 is approximately ten times as long as the duration of each light pulse 10 (column 5, lines 24-37). Since adjustment of the "length of gated flashes" would be required by the explicit instruction of Catalano, the disclosed value of 10 establishes a range (from equality of the gating of shutter 2 and the gating of shutter 4 to the disclosed value) which encompasses the recited value.

With respect to dependent claim 6, the time delay between each subsequent corresponding light pulse 10 and detection window 12 in the method of Catalano increases by approximately

1000ns. Since the values of d and n are arbitrary, and adjustment of the “periods of time between the gated flashes” would be required by the explicit instruction of Catalano, and in view of the increased clarity with a smaller d (column 7, line 64 to column 8, line 11), the disclosed value of 1000ns establishes a range (from an arbitrarily small increase depending on the choice of d and n to the disclosed value) which encompasses the recited value.

With respect to dependent claim 7, the pulse train in the method of Catalano is approximately n corresponding light pulses **10** and detection windows **12**. Since the value of n is arbitrary, and adjustment of the “rate of gated flashes” would be required by the explicit instruction of Catalano, and in view of the increased clarity with a smaller d (column 7, line 64 to column 8, line 11), the disclosed value of 4 establishes a range (from the disclosed value to an arbitrarily small d and high n) which encompasses the recited value.

With respect to dependent claim 9, the recited elements are considered to be well-known in the art of infrared sources and infrared/night-vision equipment, and it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Catalano to make use of such known elements in view of the suitability of the method for use with laser sources (column 2, lines 62-65) and high speed (column 6, lines 32-37) equipment. The wavelength of operation is entirely a choice within the ordinary skill in the art depending on the desired performance.

9. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Catalano (US004671614A) as applied to claim 1 above, and further in view of Contini *et al.* (US004603250A).

With respect to dependent claim 8, although Catalano suggests a variety of adjustments to be made in the disclosed method (column 6, lines 27-31), an increase in gain with each successive detection window **12** is not listed. Contini *et al.* shows that infrared/night-vision equipment (column

4, line 14) may accommodate changes in signal intensity by a rapid change of gain. Since the return light **6** in each successive detection window **12** in the method of Catalano will be of a generally decreasing intensity in view of the increased distance d which illuminating light **5** travels to the distance interval and the increased distance d which reflected light **6** travels from the distance interval with each successive pulse in the sequence, it would have been obvious to one of ordinary skill in the art at the time the invention was made to address these changes in signal intensity by rapidly varying (*i.e.*, increasing) the gain of the infrared/night-vision equipment **9** with each successive detection window **12** to compensate as suggested by Contini *et al.*

10. Claims 10-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laughlin (US004129780A) in view of Contini *et al.* (US004603250A).

With respect to independent claim 10, Laughlin discloses a method of detecting objects **34** corresponding to the illustrated system (Fig. 1) which is fairly identified as of the “night vision” type in view of the light source emission at 820nm (column 3, line 27). The method of Laughlin comprises the steps of activating a light source **10** in the form of a sequence of constant intensity light pulses to form a pulse train (column 4, lines 44-46), activating a camera **40** in the form of a corresponding sequence of detection windows wherein each of the windows corresponds to one of the light pulses for receiving reflected light **48** resulting from the corresponding light pulses and wherein a time delay between each subsequent detection window is increasing throughout the pulse train (column 4, lines 17-21). Laughlin further discloses that it is known to have an increasing gain to address the reduced signal intensity from longer ranges. Although this “gain increase maintains a constant signal output which is independent of range,” the disadvantages described by Laughlin suggest that the prior systems did not use a pulsed and gated system to interrogate and receive. Contini *et al.* shows that infrared/night-vision equipment (column 4, line 14) may accommodate

changes in signal intensity by a rapid change of gain. Since Laughlin already recognizes that the return light **48** in each successive detection window will be of a generally decreasing intensity as the range increases, and Contini *et al.* shows that an image intensifier receiver may increase its gain quickly as would be necessary with each successive detection window in the method of Laughlin, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Laughlin such that the camera **40** increased its gain as suggested by Contini *et al.* throughout the pulse train for the constant signal output independent of range since the pulsing interrogation and gated detection of Laughlin overcomes the disadvantage (saturation by short-range targets) of gain adjustment in the prior systems.

With respect to dependent claims 11 and 12, the receiver **40** in the method of Laughlin integrates and displays (column 4, lines 38-43).

With respect to dependent claim 13, each light pulse and each detection window in the method of Laughlin has a constant duration in view of the operation of element **22** and element **38** (column 4, lines 8-13).

With respect to dependent claim 14, the duration of each detection window in the method of Laughlin is $2\mu\text{s}$ but the duration of each light pulse is not identified. It would not take more than ordinary skill in the art at the time the invention was made to understand that the laser diode array **10** triggered by element **22** would have a pulse width less than any detection window, not least so that the detection window would encompass largely the entire reflected energy of each pulse.

With respect to dependent claim 15, the increase in time delay between each subsequent corresponding light pulse and detection window in the method of Laughlin encompasses the recited value in view of column 8, line 30 and line 39.

With respect to dependent claim 16, the light source **10** in the method of Laughlin is a diode laser (column 3, line 22) which is fairly identified as NIR in view of the disclosed emission at 820nm (column 3, line 27) and the camera **40** is high-speed (in view of the window of (2 to 200) μ s, column 4, line 13) and near infrared sensitive (since it detects the emission from near infrared source **10**).

11. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Laughlin (US004129780A).

With respect to dependent claim 18, the duration of each detection window in the method of Laughlin is 2 μ s but the duration of each light pulse is not identified. It would not take more than ordinary skill in the art at the time the invention was made to understand that the laser diode array **10** triggered by element **22** would have a pulse width less than any detection window, not least so that the detection window would encompass largely the entire reflected energy of each pulse.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Fohl *et al.* (US006429429B1) represents the application identified at paragraph [0005]. Nettleton *et al.* (US005336899A) confirms that adjustment of the intensity of a near infrared illuminator is known.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Constantine Hannaher whose telephone number is (703) 308-4850. The examiner can normally be reached on Monday-Friday with flexible hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on (703) 308-4852. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Art Unit: 2878

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

ch
July 30, 2003


Constantine Hanneher
Primary Examiner